FACT SHEET - Howard Hanson Dam

U.S. ARMY CORPS OF ENGINEERS BUILDING STRONG®

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Background:

Following a record high level of water behind Howard Hanson Dam in January 2009, the U.S. Army Corps of Engineers became concerned after discovery of two depressions on the right abutment, increased water levels in groundwater monitoring wells, and the appearance of sediment-laden water entering the abutment drainage tunnel. These concerns compelled the Corps to limit the dam's operational capacity, in order to not put it at further risk. While the dam itself is not in immediate danger of failing, there is increased risk to downstream communities until seepage concerns with the right abutment have been resolved. The Corps of Engineers placed restrictions on flood storage and established an aggressive monitoring program, in addition to other risk reduction measures. Reduced flood storage capacity results in more frequent and larger volume releases during flood events, which could increase the probability that levees in the lower valley could be overtopped. Physical actions implemented to reduce risk include construction of a seepage barrier (grout curtain) and improvements to drainage in the abutment. Extensive coordination with local communities has occurred to aid emergency preparedness.

Situation:

New investigations, testing, and engineering analyses have been performed. The Corps now has more confidence that we can safely store water to the summer conservation pool level (48 percent of full). However, the Corps is not yet assured that Howard Hanson Dam can safely store large flood inflows. The Corps is conducting a dam safety study to determine the best solutions to allow normal operation. The Corps has reviewed and concurred with the concept of additional measures identified below. The final report will be completed in November 2010.

Key Points:

- Public safety is the Army Corps' number one priority. The Corps is working with local communities to prepare for the risk of flooding to downstream areas using the best available information.
- Recent engineering investigations and previously completed actions greatly improve our understanding of the conditions at the dam and increase our confidence in the structure.
- While we have increased confidence in the dam for the upcoming flood season, there is still a credible risk (≈ 1:60) that flows in the lower valley could exceed the capacity of the levees downstream should large flood events occur.
- We have determined that additional corrective actions are needed to restore the dam to a safe condition and to provide full flood storage capacity. We are expecting to begin construction this winter of some additional measures to help further reduce risk including the installation of additional filtered drains in the right abutment and improvements to and extension of the existing drainage tunnel.
- Upon the receipt of funds, construction could be initiated in the fall of 2010.
- However, we will not be able to operate to full flood control capacity until studies and designs are reviewed; and repairs are in place and tested to ensure success.
- When these additional measures are completed, the Corps anticipates being able to resume normal operations. The Corps will continue to monitor the dam to ensure effectiveness of the corrective measures, especially during high flow events. Depending upon the results of the ongoing dam safety study, additional measures may be needed to be implemented to further address identified risk concerns.
- The return of full operational capacity of Howard Hanson Dam, in partnership with a functioning levee system downstream does not eliminate all risks of flooding. The dam and levees only reduce the risk of flooding.

Additional Background Information:

Howard Hanson Dam is located on the upper reach of the Green-Duwamish River in King County, 63.76 river miles above the mouth. It is in the city of Tacoma's municipal watershed 35 road miles east of Tacoma, 6 miles upstream from Palmer. This project is protected from public access.

The Howard Hanson Dam serves multiple purposes by providing flood risk reduction, water storage for river flow regulation, municipal water supply and summer low flow augmentation for fish spawning. Flood risk reduction in the Green-Duwamish River Basin is accomplished by capturing excessive water runoff from the upper drainage area of the river and releasing the water under controlled conditions. After the end of the annual winter flood season, water is gradually stored in the reservoir beginning about March 1 for municipal water supply and to augment the river flow for the benefit of fish.

Flood damage prevented by Howard Hanson Dam from the January 2009 flood is estimated at about $4 billion.

The dam is an earth and rockfill structure with inclined impervious core and filters. Outlet works on the left bank consist of an approach channel, an intake structure providing upstream control, a 19-foot diameter horseshoe concrete-lined tunnel, a stilling basin, and an auxiliary 48-inch diameter bypass pipe. A gated spillway on the left abutment with two 45 by 30-foot tainter gates permits reservoir storage to elevation 1,206 without utilizing the spillway for discharge. The paved spillway chute is 656 feet long.

The Corps of Engineers constructed a seepage barrier in November 2009 to reduce seepage and improved the drainage of the right abutment by installing drains that more effectively direct seepage into the drainage tunnel. Testing this spring showed that the work controlled seepage more effectively. However, the 2009 grouting is not considered a permanent repair.

Along with the addition of vertical and horizontal filtered drains and extending the drainage tunnel, the Corps is pursuing projects to increase confidence that the dam can safely operate during extreme flood events. These measures include:

- Installation of additional log booms to prevent debris from blocking the spillway
- Improvements to the spillway to allow improved flow passage
- Further stabilizing the spillway by improving how it is anchored to bedrock
- Placing rock in key places along the upstream face of the dam to protect it against erosion from fast-moving water in the event the spillway is used.